The Effects of Three Types of Goal Setting Conditions on Tennis Performance: A Field-Based Study

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Utilizing a two-stage random sampling technique, this study investigated the effect of three types of goal setting conditions (self-set, instructor-set, and “do your best” control) on tennis serving performance of college students (N = 156) in nine beginning tennis classes. A 3 x 2 x 5 (goal setting conditions x gender x trials) ANCOVA with repeated measures on the last factor and baseline performance as the covariate was computed. A significant interaction of goal setting conditions by trials was revealed (p < .003) with follow-up procedures favoring the instructor-set and self-set goal groups over the “do your best” group at the second and fourth trials. Further, at trial two, the instructor-set group was statistically superior to the self-set group. From this significant interaction, it appeared that the instructor-set and self-set goals enhanced students’ performance on the tennis serving task.

Locke’s (1968) goal setting theory proposed that difficult yet specific goals enhance performance. This theory has been widely supported in the research literature of the Industrial/Organizational (I/O) sciences in both laboratory and field studies (for reviews, see Locke & Latham, 1990b; Locke, Shaw, Saari, & Latham, 1981). In fact, approximately 90% of the goal setting research supports the use of goals over no goals in I/O settings. In contrast, goals have been shown to enhance performance in only about 70% of the research studies in sport and physical activity settings with most of these studies conducted within the realm of sport and exercise psychology (Burton, 1994). However, a recent meta-analysis on goal setting...
in the sport and physical activity domain reported that, overall, goal setting improved performance by about one-third of a standard deviation (ES = .34, a large effect size for a multi-variate analysis; Cohen, 1969) (Kyllö & Landers, 1995). These researchers reported that goals which were moderate in difficulty, absolute, and that used both short- and long-term goals produced the greatest effects.

The statistically nonsignificant findings of studies conducted in the sport and physical activity domain have been attributed to several methodological problems identified by Locke (1991). Specifically, this researcher cited three major flaws that have plagued goal setting research in the motor domain: (a) failure to control for spontaneous goal setting in the control or “do your best” group, (b) failure to measure personal goals, and (c) failure to set specific goals at an appropriate level of difficulty. Locke (1991, 1994) stated that spontaneous goal setting could be controlled by either eliminating feedback or giving ambiguous feedback. In a response to Locke (1991), Weinberg and Weigand (1993, 1996) addressed the issue of spontaneous goal setting and stated that the removal of naturally occurring feedback would threaten the external validity of these studies. One possible way to limit spontaneous goal setting is the choice of task. Boyce (1990a, 1990b, 1994) found that task novelty and/or participants’ lack of experience with a task could limit participants’ ability to spontaneously set goals. In addition, the difficulty level of the short-term goals could be handled through the establishment of specific goals that produced about a 10% to 30% success rate.

The present study addressed the effects of three goal setting conditions (instructor-set, self-set, and “do your best”) on the performance of a tennis serving task. The goal setting literature related to these three conditions has indicated that the goal setting conditions (self-set and instructor-set) were superior to a no goal control group (Boyce, 1992; Hall & Byrne, 1988; Lee & Edwards, 1984). Further, these studies reported no significant difference between the two goal setting conditions (self-set and instructor-set). In contrast to these findings, other researchers (Boyce & Wayda, 1994; Hillery & Wexley, 1974; Mento & Locke, 1992) found that instructor-set goals were superior to self-set goals. However, many other studies reported no difference between goal conditions and a no goal control group (Anshel, Weinberg, & Jackson, 1992; Weinberg, Bruya, Garland, & Jackson, 1990). This lack of significance related to goal setting has been attributed to flaws in the research designs (Locke, 1991) previously addressed.

The use of goals in physical education settings has been supported by numerous pedagogists and educational researchers (e.g., Harrison, Martinek, Mohnsen, McSwegin, Rink). Similar to the recommendations found in the general goal setting literature, pedagogists have recommended that goals should be specific and realistic (set at an appropriate level of difficulty) (Harrison, Blakemore, Buck, & Pellett, 1996; Levitt, 1992; Martinek & Griffith, 1993; Pemberton & McSwegin, 1989; Rink, 1993). Further, there are many examples of the use of goal setting within the context of physical education: (a) Mohnsen’s (1997) student set goals, (b) Pemberton and McSwegin’s (1989) fitness goals, and (c) Martinek and Griffith’s (1993) steps to successful student achievement via a goal setting process. In addition, goal setting research has been conducted with students in physical education classes (i.e., Barnett & Stanicek, 1979; Frierman, Weinberg & Jackson, 1990; Weinberg et al., 1990). The inconclusive results of these studies paralleled the findings in other goal setting research within the sport and physical activity domain. Since the findings of goal setting studies across physical activity and sport
have been less convincing than those produced in I/O settings, further research is warranted to investigate the effects of goal setting on task performance with research designs that attempt to account for the methodological concerns voiced by Locke (1991, 1994). Further, to increase the ecological validity of the findings of goal setting research, it seems apparent that more research is needed in the teaching/learning context so that practical applications for goal setting strategies can be recommended to teachers who attempt to use goal setting in their respective classes. Therefore, the purpose of this study was to investigate the effects of goal conditions (instructor-set, self-set, and do your best) on motor skill acquisition and retention.

Method

Preliminary Procedures

Prior to a pilot study, two subject matter experts completed the following tasks: (a) designed instruction for a beginning tennis class that was appropriate for college-aged students, (b) selected a tennis serve test that had acceptable statistical properties (e.g., reliability and validity) and was feasible to administer in the research/class setting, and (c) derived possible long-term goals and absolute, short-term goals for the instructor-set goal group (these goals were based on information taken from Hewitt's [1966] tennis serve scoring scale for college age students).

A pilot study ($N = 20$) was conducted to field test the research protocol and assess the level of difficulty of the proposed absolute, short-term goals for the instructor-set goal group. In addition, the long-term goal, which functioned as a manipulation of goal difficulty for the instructor-set and self-set goal conditions, was evaluated (Hall & Byrne, 1988). This pilot study provided the opportunity to test the logistics of form completion (e.g., demographics form, spontaneous goal setting form, debriefing form) and gain input from students and the instructor who completed the class under the instructor-set condition.

Results from the pilot study on the long-term goal for the instructor-set goal group revealed that only 55% of the participants achieved the goal (50% improvement from the baseline through tennis serve session four). The pilot test revealed only 10% of the participants achieved the absolute, short-term goals across the four serving sessions. As a result these goals were modified by reducing the difficulty level of short-term goals for the later serving sessions. Given the nonsignificant difference between performance gains under moderate and difficult goals, previously reported in Boyce (1990a) and Weinberg, Bruya, Jackson, & Garland (1986), and based on the subject matter experts' advice regarding the problem of increasing goal difficulty too quickly via more difficult goals, the revised (slightly easier) short-term goals and the moderate long-term goal were deemed acceptable for the present study. Lastly, some differences in performance were noted between males and females in the pilot study.

Participants and Instructors

University students ($N = 156$) who ranged in age from 18 to 33 ($M = 19.45$, $SD = 2.90$) and were enrolled in 1 of 9 beginning tennis classes were participants. Approximately three-fourths of the participants were females with males constituting the remaining one-fourth. While almost all of the participants reported attempting to play tennis on several previous occasions, over 85% of the students
described themselves as novice tennis players. This percentage was consistent across all three goal setting conditions. The protocol for this study was approved by the Institutional Review Board, and all participants signed an informed consent form.

One male instructor, knowledgeable in tennis, taught all nine tennis classes. This instructor had played tennis for 25 years and had taught and/or coached tennis for 5 years. Classes were balanced via a stratified random assignment technique so that the instructor taught three classes of each of the three treatment conditions (instructor-set, self-set, and “do your best”). The same instructor was utilized in order to maintain instructional consistency.

Task

All students completed the prescribed beginning tennis class over a 15-week period. The Hewitt (1966) Tennis Speed of Service and Service Placement Test was used to collect performance data related to serve placement and speed. Hewitt (1966) reported validity coefficients for beginning tennis players of .72 for serve placement and .89 for serve speed and test-retest reliability coefficients of .94 and .84 for service placement and speed, respectively. These tests were correlated with the results of a round robin tournament play.

Hewitt’s serve test is scored according to accuracy and power. Participants perform 10 trials attempting to serve the ball between the net and a rope suspended 7 feet above the ground, having it land in specific areas of the service court and rebound beyond the baseline. Accuracy is scored according to the passage of the ball between the net and the rope, and the placement of it in the service court. Power is scored according to the distance from the net to where the ball lands after the first bounce. Higher scores are awarded for serves landing in corners of the service court and rebounding beyond the baseline. Scores for each trial may range from 0 to 10 points for serve accuracy, and the test score is the sum of the 10 trials. The Tennis Speed of Service test was scored in a similar manner with the only difference related to scoring of possible points ranging from 4 to 0. The Speed of Service and Service Placement tests were administered simultaneously with participants serving 10 times. A total score was computed by adding the Speed and Placement scores together. This was done since the tennis serve involves both speed and accuracy.

Using the Hewitt tennis serve test, data were collected over six sessions across the 15 weeks. The data collection periods were completed at approximately 2-week intervals. Two tennis courts were set up for this testing procedure with an instructor and a researcher monitoring the two testing courts. Participants were tested in groups of four with their partners scoring the placement and speed of each score under the direct supervision of the instructor or researcher. This particular task (Hewitt's test) was selected due to the test's (task) novelty and to the participants’ inexperience with this task, which could possibly limit spontaneous goal setting of participants in the control group.

Manipulation of Level of Goal Difficulty

The level of goal difficulty was manipulated through the establishment of a long-term percent improvement goal (Hall & Byrne, 1988). From the pilot test data and based on the advice of the subject matter experts, a 50% improvement could be expected on the tennis serve test (i.e., if a participant scored 20 on the
pretest then he or she could expect to improve his or her score to 30 on the post-test based on a 50% improvement). This percentage long-term goal (50% improvement) was communicated to the self-set and instructor-set goal conditions by the instructor after the completion of the baseline phase of the investigation.

Goal Setting Conditions

*Instructor-set short-term goals and long-term goal.* Participants were informed of the long-term goal as previously described. In addition, prior to each tennis serve test session, participants were assigned an absolute, short-term goal for the session. Participants recorded their performance scores (score on the tennis serve test) for each session.

*Self-set short-term goals and long-term goal.* Participants were informed of the long-term goal as previously described. Prior to each class session participants were required to set and privately record a short-term goal. Participants recorded their short-term goals as well as their actual performance scores for each session.

*Do your best (control).* Participants in this group were instructed to “do your best.” Similar to the other groups, these participants recorded their performance scores, but no specific goals were solicited from or communicated to this group.

**Design and Procedure**

Following the instructional orientation of the tennis classes, participants were tested to determine their baseline scores on the Hewitt (1966) tennis serve test. At this point, classes were assigned to one of three goal setting conditions. The decision to utilize intact groups (i.e., individual classes) was based on the need to limit any social comparison that might occur if participants in the same class were assigned to different goal setting conditions. However, participants were used as the unit of analysis as opposed to intact groups (classes) for the following reasons. Four questions/issues proposed by Silverman and Solmon (1998) were used to frame this discussion related to the unit of analysis. First, the dependent variable (e.g., tennis serve) was measured at the student level. Each participant demonstrated their own individual tennis serving ability. Second, even though there was a treatment applied across the classes, the participants in the self-set goal group privately set their own goals, and the participants in the control group (do your best) were left to their own devices. The participants in the instructor-set group received absolute goals, but this procedure was applied based on the recommendations of Kyllo and Landers’ (1995) meta-analysis findings. Third, the dependent variable (tennis serve score) was independent among participants. The tennis serve of one person did not depend on another person’s skill performance. Fourth, in this study there was a moderating variable (the participant’s initial skill performance in the tennis serve), and it was controlled for through the application of a covariance technique. Specifically, the baseline score was used as the covariate. In addition to these considerations, and after consulting with Ted Baumgartner (personal communication, April 19, 2000), it was decided that the application of a two-stage random sampling technique (see Baumgartner & Strong, 1998) would further address this concern. Therefore, classes were randomly assigned to treatments (stage one), and then 80% of the participants were randomly selected from each class for
data analysis (stage two). This process reduced the original subject pool from 195 to 156. There is precedence for the use of a two-stage random sampling technique with participants in classes (see Boyce, 1990a, 1992).

In order to increase internal validity of the study the following steps were implemented. First, standardized instruction in the form of lesson plans was used to standardize the class content and to control for practice opportunity of the tennis serve. This was verified by the researchers during regular visits to ensure the fidelity of the instruction and opportunity for skill practice on the serve. During those visits, it was noted that when participants were given the opportunity for skill practice, they complied. Since there were many tennis courts and ample equipment, these factors did not hinder the practice of the tennis serve. The lesson plans stated the number of minutes that were spent practicing the serve, and this was applied regardless of the class or treatment condition. Second, participants were tested in small groups of their own choosing to help control for social comparison that might occur with large group testing. Further, participants who were not directly involved in the testing were assigned to the tennis courts in back of the two testing courts to eliminate a possible audience effect. Third, the goals set by the participants themselves (self-set group) were only known to each participant. Fourth, the instructor wasn’t informed of the goal setting condition assignments until after completion of the baseline trial. Further, the instructor was not informed of the researchers’ hunches regarding the research question. Goal setting is one of the least invasive performance enhancement techniques. Once students were trained to receive or set goals, the procedure occurred very quickly, and there wasn’t a lot of time for the instructor to influence the goal setting process. In addition, routine class visits by the researchers verified that participants received the same class content and opportunity for skills practice regardless of the goal setting condition. Lastly, the opportunity to practice the actual tennis serve test outside of class was limited since the test set-up was difficult to replicate. Information from the debriefing verified that participants did not practice the Hewitt serve test outside of class.

Students were informed that the study was designed to evaluate specific teaching techniques in physical education classes. Further, they were told that all data would remain anonymous and be used only for research purposes. However, they were not told the specific construct (goal setting) under investigation. The instructor also emphasized the importance of honesty when completing forms and performing assigned tasks. Participants were encouraged to give their best effort in the tennis serve test sessions regardless of the goal setting condition applied. For motivation, students were informed that a portion of their grade in the class would be based on their performance.

At the conclusion of the class, students in the control group were polled via a written survey as to their spontaneous goal setting behavior on long- and short-term goals. The survey utilized a goal classification system (improvement, specific, and no goal) designed by Locke and Bryan (1966). This survey posed questions on long-term and short-term goals that classified participants into one of three goal categories: (a) specific, numerical; (b) improvement; and (c) no goals. This question was asked since Hollingsworth (1975) indicated participants with knowledge of results may set their own goals independent of the researcher. The data collection protocol consisted of six tennis serve measures: (a) a baseline measure, (b) four performance measures, and (c) a 2-week retention measure. The research methods used in the present study were similar to those used in Boyce and Wayda (1994).
Results

Effects of Goal Setting on Performance and Retention

Utilizing a two-stage random sampling technique, a 3 x 2 x 5 (Goal Setting Conditions x Gender x Trials) ANCOVA with repeated measures on the last factor and baseline performance as the covariate was computed to analyze the effects of goal setting conditions and gender on performance. Gender was included as part of this analysis due to the unequal number of males and females in each condition as well as the possible presence of a gender difference on the serving task since a difference was noted in the pilot study. A multivariate F test, which made no assumptions of homogeneity of variance issues (e.g., symmetry, sphericity) for the repeated measures design related to the variance-covariance matrix, was utilized (Norusis, 1988). Planned comparisons, which included Tukey’s HSD and mixed-effects procedures, were applied as follow-up analyses, where appropriate. The $p < .05$ was established as the acceptable level of significance for all follow-up analyses. While all significant interactions and main effects are reported, the interaction effect supersedes the main effects, and therefore only the significant interaction was interpreted. Due to the application of the covariate (baseline scores), the analysis reflects adjusted scores.

There was a significant interaction of goal setting conditions and trials, $F(8, 298) = 3.00, p < .003$, which indicated differing performance and retention patterns among the three goal setting groups across the trials. Differences among goal setting groups at each trial were computed using planned pair-wise comparisons and mixed-effects analysis. The instructor-set and self-set goal groups were statistically superior to the control group at the second and fourth trials (test sessions). Further, at trial two, the instructor-set goal group was statistically superior to the self-set group. The means and standard deviation scores (vertical lines) of each group at each trial are illustrated in Figure 1 and Table 1. The remaining interactions were not significant.

The main effect of goal setting conditions was significant, $F(2, 151) = 4.94, p < .009$, which indicated the goal setting conditions had an overall effect on tennis serve test performance. Tukey’s post hoc procedure indicated that the instructor-set ($M = 17.03, SD = 4.97$) and self-set goal ($M = 16.36, SD = 5.12$) setting conditions were significantly superior to the control group ($M = 14.64, SD = 4.99$).

A significant main effect for trials was found, $F(4, 151) = 16.07, p < .0001$. Follow-up procedures indicated that as trials progressed, performance improved over the six tennis serve test sessions (trials).

Analysis also revealed a significant main effect for gender, $F(1, 151) = 5.71, p < .02$. Males’ overall performance ($M = 18.42, SD = 5.41$) on the tennis serve test was superior to females ($M = 15.19, SD = 4.20$).

Debriefing

In order to discern the control group’s spontaneous goal setting behavior, a goal classification system (improvement, specific, and no goal) designed by Locke and Bryan (1966) was administered to the control group following the completion of the study. Regarding spontaneous goal setting behavior, the following findings were revealed. When participants in the “do your best” group were asked about the spontaneous setting of short-term goals, 12% ($n = 6$) responded they had set specific,
Figure 1 — Adjusted mean scores and standard deviations (vertical lines) of the three goal setting conditions across trials (tennis serving sessions).

Table 1  Goal Setting Conditions by Trials

<table>
<thead>
<tr>
<th>Trial</th>
<th>Adj. mean</th>
<th>SD</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseline (covariate)</td>
<td></td>
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<tr>
<td>SS</td>
<td>11.23</td>
<td>5.70</td>
<td>55</td>
</tr>
<tr>
<td>I</td>
<td>11.00</td>
<td>5.78</td>
<td>50</td>
</tr>
<tr>
<td>C</td>
<td>10.92</td>
<td>5.80</td>
<td>51</td>
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<tr>
<td>Trial 1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SS</td>
<td>14.08</td>
<td>7.55</td>
<td>55</td>
</tr>
<tr>
<td>I</td>
<td>13.26</td>
<td>5.25</td>
<td>50</td>
</tr>
<tr>
<td>C</td>
<td>12.67</td>
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<tr>
<td>SS</td>
<td>14.03</td>
<td>6.13</td>
<td>55</td>
</tr>
<tr>
<td>I</td>
<td>17.07</td>
<td>6.85</td>
<td>50</td>
</tr>
<tr>
<td>C</td>
<td>11.86</td>
<td>5.49</td>
<td>51</td>
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<tr>
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<td></td>
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<tr>
<td>SS</td>
<td>16.53</td>
<td>6.66</td>
<td>55</td>
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<tr>
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<td>6.36</td>
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</tr>
<tr>
<td>C</td>
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<td>SS</td>
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<td>5.75</td>
<td>55</td>
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<tr>
<td>I</td>
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<td>6.34</td>
<td>50</td>
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<tr>
<td>C</td>
<td>15.06</td>
<td>5.85</td>
<td>51</td>
</tr>
<tr>
<td>Retention</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SS</td>
<td>19.90</td>
<td>6.02</td>
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<td>I</td>
<td>19.37</td>
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<td>50</td>
</tr>
<tr>
<td>C</td>
<td>17.92</td>
<td>5.55</td>
<td>51</td>
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</table>

*Note.* SS = Self set goal group; I = Instructor assigned goal group; C = “Do your best” group.
numerical short-term goals. Further, 33% \((n = 17)\) set improvement goals, and the remaining 55% \((n = 28)\) set no goals. In addition, the spontaneous long-term goal setting behavior was examined for the control group. When the percentages of all three goal setting conditions (specific, improvement, and no goals) were compiled related to spontaneously set long-term goals, it revealed a picture somewhat similar to the spontaneous short-term goal setting behavior of the control group with 10% setting specific numerical goals, 41% setting improvement goals, and 49% setting no goals.

In addition, the overall adjusted mean performance scores for each reclassified member of the control group (Locke & Bryan, 1966) were calculated: (a) \(M = 14.07, SD = 3.78\) for the no goal group; (b) \(M = 13.01, SD = 5.32\) for the improvement group; and (c) \(M = 16.18, SD = 2.81\) for the specific numerical group. Based on these data, a trend emerged that suggested that participants who independently set specific, numerical goals may perform better than participants who set improvement or no goals.

Post Hoc Analysis of Goal Difficulty

A calculation was made of the success level of participants with short-term goals in the instructor-set goal group. Findings indicated that 15% of the time, these participants successfully accomplished their instructor-set goals. In addition, the success rate of the long-term goal (50% improvement) showed that 51% of the participants in the “do your best” control group achieved the long-term goal, compared to 62% of the participants in the instructor-set goal group and 55% of the participants in the self-set group.

Discussion

This study investigated the effect of three types of goal setting conditions (self-set, instructor-set, and “do your best” control) on tennis performance of college students \((N = 156)\) in beginning tennis classes.

A significant interaction of goal setting conditions and trials (tennis serve test sessions) indicated that the instructor-set and self-set goal groups were statistically superior to the “do your best” control group on trials two and four. This finding of the superiority of goals over no goals is well supported in the I/O literature as well as partially supported in the research on physical activity (see Barnett & Stanicek, 1979; Boyce, 1992; Hall & Byrne, 1988, Lee & Edwards, 1984; Weinberg, Bruya, Longino, & Jackson, 1988). Further, the research of Chacko (1982) and Locke and Schweiger (1979) proposed that when goal difficulty was held constant, there was no statistical difference in performance between groups who had instructor-set goals and those who had self-set goals. From this finding, it appears that Locke’s (1968) original thesis, which asserted that difficult yet specific goals enhance performance, has been supported.

It is also important to note that the instructor-set goal and self-set goal groups were only superior to the control group during part of the instructional phase of the study (during trials 2 and 4) and not significant during the retention phase (trial 5). However, goals were not used in the retention phase of the study.

At trial two the instructor-set goal group was also statistically superior to the self-set goal group. The finding related to the efficacy of instructor-set goals over
the “do your best” was consistent with the work of Kyllo and Landers (1995) and Locke and Latham (1990a). The finding of the significantly higher performance of the instructor-set goal group over the self-set group on trial two was consistent with the research of Boyce and Wayda (1994) and Mento and Locke (1992). In addition, Hillery and Wexley (1974) reported that beginners preferred instructor-set goals over self-set goals. An examination of the goals set by the self-set group revealed that this group’s goals averaged eight points less per session than the instructor-set group’s goals. Further, a review of the literature revealed that three factors might account for the effectiveness of instructor-set goals. First, the act of assigning goals to participants implied that the teacher, who was viewed as an authority figure, had confidence in the participants’ ability to achieve those goals, and this may have increased the participants’ self-confidence (Milgram, 1969; Salancik, 1977). Second, the assignment of difficult goals challenged (15% goal achievement - level of difficulty) and may have increased the participants’ level of intrinsic motivation to accomplish the task (Anshel, et al., 1992; Mento & Locke, 1992). Third, Bandura (1988) stated that assigned (instructor-set) goals defined a standard of performance that may have led to increased self-satisfaction.

Spontaneous Goal Setting of Control Participants

Spontaneous goal setting behavior of the participants was low with only 12% setting specific, numerical goals and 34% setting improvement goals. The low percentage of participants who spontaneously set specific, numerical goals could be attributed to the novelty of the serve test, which could have made it difficult to set appropriate goals (Boyce, 1990b, 1992, 1994). It is important to note that participants who set specific, numerical goals averaged 16.18 points whereas participants who set either improvement ($M = 13.01$) or no goals ($M = 14.07$) performed at lower levels. It would appear from these data (mean scores) that only the spontaneous setting of specific, numerical goals produced the desired effect regarding performance gains.

In summary, the findings supported the efficacy of goal setting on performance when (a) short-term goals were absolute (Kyllo & Landers, 1995), (b) long- and short-term goals were used (Kyllo & Landers, 1995), (c) goal difficulty was set at about a 15% success rate (close to Locke’s recommended 10% success rate), and (d) spontaneous goal setting was controlled with only 12% of the participants in the control group setting specific, numerical goals (Locke, 1991). With the spontaneous goal setting somewhat controlled and the goals set at an appropriate level of difficulty, these two design factors allowed researchers to adequately test the effect of the three goal setting groups on performance. Based on the current findings as well as other similar research, it appears that if pedagogists use goal setting as a performance enhancement strategy, they (a) should use goals (instructor-set and self-set) as a performance enhancement strategy as opposed to no goals, (b) should use both short- and long-term goals, (c) may use instructor-set over self-set goals with beginners, and (d) should set goals at an appropriate level of difficulty (difficult yet not impossible).

In the present study, the researchers realized that there were some inherent limitations in studies of this type. For example, students were not randomly assigned to treatments. However, with the application of the two-stage random sampling technique, we believe that this concern has been adequately addressed. Further,
we also addressed each of the four issues voiced by Silverman and Solmon (1998) regarding the unit of analysis and believe that these were also sufficiently answered. However, similar to other colleagues who also conduct research in field-based settings, we still think that "assessing all students in intact classes is a more realistic measure of student performance than assessing only a few students in many classes" (Harrison, Preece, Blakemore, Richards, Wilkinson, & Fellingham, 1999, p. 53).

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